

INVESTIGATOR'S ANNUAL REPORT

National Park Service

All or some of the information provided may be available to the public

Reporting Year: 1999	Park: Shenandoah NP						
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Additional investigators or key field assistants (first name, last name, office phone, office email): <table> <tr> <td>Name: George M. Hornberger</td> <td>Phone: 804-924-6762</td> <td>Email: n/a</td> </tr> <tr> <td>Name: J. Rick Webb</td> <td>Phone: 804-924-7817</td> <td>Email: n/a</td> </tr> </table>		Name: George M. Hornberger	Phone: 804-924-6762	Email: n/a	Name: J. Rick Webb	Phone: 804-924-7817	Email: n/a
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Permit#: SHEN1999N-253							
Park-assigned Study Id. #: unknown							
Project Title: Hydrologic And Geochemical Controls On Episodic Acidification Of Streams In Shenandoah National Park, Virginia: Development And Testing Of A Predictive Model							
Permit Start Date: Jan 01, 1999	Permit Expiration Date Jan 01, 2000						
Study Start Date: Jan 01, 1999	Study End Date Jan 01, 2001						
Study Status: Completed							
Activity Type: Research							
Subject/Discipline: Water Resources							
Objectives: This project examines the connection between rock-water interaction. Through coupled modeling of water and solute transport with geochemical reactions, a framework for quantifying the space-time continuum of geochemical processes occurring within selected SNP catchments will be developed. The hypothesis is that a continuum representation is crucial to a greater understanding of the dynamics of the relationship between flow path evolution, acid-buffering processes, and stream chemistry. Specific objectives are to: 1) develop a theoretical framework for quantifying transient, topographically controlled water movement and reactive mass transport in the subsurface; 2) calibrate and test this framework at 3 catchments at time scales ranging from episodic to annual; and 3) examine model sensitivity to both hydrological and geochemical parameters, to determine controls on stream chemistry.							
Findings and Status: Soil-water lysimeters were installed in each of the 3 catchments, and soil-water samples were collected in September and analyzed. Hydrologic and topographic data sets for each of the 3 catchments were compiled. Initial modeling using the original calibration catchment (South Fork Brokenback Run) was done for Paine Run. Recession analysis of hydrographs for Paine Run was performed, providing model parameters that improved the calibration of the model specifically for Paine Run. Preliminary model calibration indicates lower transmissivities and thinner soils at Paine Run than at South Fork Brokenback Run, which implies that bedrock lithology may also influence stream susceptibility to acid episodes by favoring rapid flow paths over slower flow paths. An abstract describing these findings was presented at the Virginia Water Research Symposium in Richmond, Va. in November.							
For this study, were one or more specimens collected and removed from the park but not destroyed during analyses? No							
Funding provided this reporting year by NPS:	Funding provided this reporting year by other sources:						

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Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college	
Full name of college or university: University of Virginia	Annual funding provided by NPS to university or college this reporting year: 34449